YPG SPOTLIGHTS VIRTUAL PROVING GROUND TECHNOLOGY

Marcella Chavez

Boom! Thunder! Crack! The unmistakable sound of an explosive blast pierces the otherwise quiet "computer hub" at the U.S. Army's Yuma Proving Ground (YPG) Ammunition Operations Center. On a computer screen, the M1A1 Abrams Main Battle Tank, located many miles away, visibly quakes as a projectile flies from its jolting, ominous-looking gun barrel.

Via a remote camera on the test site, everything at the gun position is easily visible. Computer instructions tell the camera which way to turn to film the test. Watching the Abrams in a live-fire demonstration on a computer screen, and seeing the software capability that can instantaneously "grab" and make a still digital photo ready for immediate Internet transmission, is truly a remarkable feat. And then, as if that's not enough, firing data stream in at an unbelievably fast pace—literally faster than the flick of an eye. The data streams are instantaneously "data based" for use by engineers via the Internet before the round can impact its target!

But that's just the tip of the iceberg when it comes to detailing the accomplishments of Mark Lauss (who mans the computer station) and his co-workers. Lauss, a computer specialist for YPG's Engineering Division, is quick to admit he couldn't have performed the intense data capture and transmission online without the talented help of many others, some from private industry.

YPG is proud to call itself the Army's premier proving ground and a joint asset for all of America's Armed Forces. Throughout the year, an extremely wide variety of military tests take place at YPG, from helicopter armament tests and long-range artillery tests to parachute and main battle tank tests. Nearly 167,000 rounds were fired at YPG during the past 12 months.

YPG is known for its sophisticated computers that allow engineers to track the progress of each test as it occurs to provide instantaneous feedback. Now it will be able to feature an Internet capability for its customers to view testing online.

Lauss' motto is "have computer will travel." He demonstrated just what that means during a recent conference in Huntsville, AL, where video and data feeds from a live firing at YPG's Red Bluff Firing Range were shown.

"First, the gun goes bang. Immediately, discreet data appear here before the bullet hits its target—in some cases, before the projectile's time of flight is known," says Lauss. The demonstration in Huntsville involved data gathered from the firing of an M1A1 Abrams tank and proved that firing data can be displayed moment by moment. And, by using "push technology" to update Internet databases, this information can be seen in Los Angeles and New York simultaneously.

"It was easy for those watching in Huntsville to understand how this capability will aid Yuma Proving Ground in sending and obtaining information at its hot, cold, and tropical test sites," said Lauss. "We now have a 'window' for seeing into other test environments, testing the same equipment at the same time, and customers can see into this window," he added.

Lauss said that joint testing and remote information distribution via the Virtual Proving Ground (VPG) are the way things are going to be done in the future. Providing a connection for models and corresponding databases will play a major roll in supplying test data to YPG customers, and will ensure its reputation as a vital player in the test community.

Lauss' excitement is refreshing. "I was remotely controlling what the camera was looking at. I was literally acting as test controller and conductor of teleconferencing—not just video, but video and voice. It was great! I did the countdown without disturbing the guys in the field. The folks in Huntsville didn't know where I was, which was good. I could have been showing them a test from Iowa or somewhere other than Yuma Proving Ground," he said.

Within seconds after the tank fired, Lauss provided data on bullets, chamber pressures, the decay of velocities, rates of velocities in flight, initial velocities, and meteorological information. On the computer screen, these discreet events are color coded to make them easier to recognize.

Lauss said it is exciting to see how specific the data transfer process can be. "In essence," continued Lauss, "we validated the process of using the Internet to pass data through the installation's firewall. We proved we could open the firewall for a very specific channel."

Lauss said the last major task would be to encrypt the data to ensure it's safe and secure on its trip. Another feature they demonstrated is that they could immediately see who viewed their information and when.

"It's been a long couple of years working on the VPG. Not many thought we could pull it off, but through teamwork it was done in a relatively short time," said Cindy Sullivan, Operations Research Analyst, and primary point of contact for YPG's Virtual Proving Ground efforts.

Obtaining hardware was the easy part. A stand-alone computer was needed to collect isolated information and pass only selected data to the computer in Huntsville. The demo had to be isolated from the rest of the system. There had to be a stand-alone computer that could collect isolated information and pass only selected data to the Huntsville computer.

It was the security issue that had to be resolved. The installation had to prove it could be selective about sending information to another location.

On the horizon is the coordination of not one but two simultaneous firing tests, in the direct and indirect firing modes. "This is incredible in itself," said Lauss, "but what we'll do is use the wireless Ethernet for transferring test data on the ballistic/vehicle data transfer system." Data out on the range can be sent wirelessly to his computer center. "You see this box and antenna here?" said Lauss, pointing to a box about the size of a large briefcase and a small 2-foot long antenna. "These two devices are fast replacing a whole van full of equipment. We will soon be able to do the same thing using wireless technology. But that is another story all by itself."

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